

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

## UNITED STATES PATENT AND TRADEMARK OFFICE

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### BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

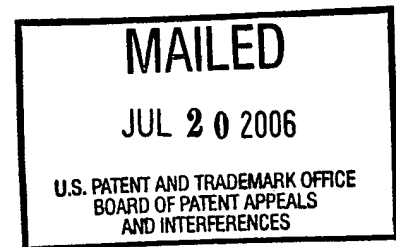
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Ex parte PAUL R. SCHIMMEL

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Appeal No. 2003-1335  
Application No. 08/249,689<sup>1</sup>

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Before SCHEINER, MILLS and GRIMES, Administrative Patent Judges.<sup>2</sup>

SCHEINER, Administrative Patent Judge.

### REQUEST FOR REHEARING

This application has previously been on appeal (Appeal No. 1997-2396). Following an oral hearing on February 6, 2001, we issued an opinion (dated April 30, 2001) reversing the examiner's rejection of claims 1 and 3-21 for lack of enablement under the first paragraph of 35 U.S.C. § 112, and entering a new ground of rejection against claims 11-13, 17-19 and 21 under the first paragraph of 35 U.S.C. § 112 for

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<sup>1</sup> Application for patent filed May 26, 1994. According to appellant, this application is a continuation of application serial no. 08/129,787, filed September 29, 1993, now abandoned, which is a continuation of application serial no. 07/586,534, filed September 21, 1990, now abandoned. This application is also related to application serial no. 07/929,834, filed August 14, 1992, now U.S. Patent 6,446,032.

<sup>2</sup> The merits panel that issued the initial opinion and the remand in this case included Administrative Patent Judge William F. Smith, who retired from the U.S. Patent and Trademark Office before the Directors of Technology Center 1600 submitted their Request for Reconsideration. Administrative Patent Judge Eric Grimes has replaced Administrative Patent Judge William F. Smith on this merits panel. See In re Bose Corp., 772 F.2d 866, 227 USPQ 1 (Fed. Cir. 1985).

failure to provide an adequate written description of the claimed subject matter. As provided for under the then existing provisions of 37 CFR § 1.196(b)(1), appellant opted to continue prosecution of this matter before the examiner, amending the claims and submitting new evidence for the examiner's consideration. The examiner maintained the new ground of rejection, and that rejection, in turn, became the subject of the present appeal.

Following an oral hearing on July 17, 2003, we issued an opinion in the present appeal (dated October 30, 2003) affirming the written description rejection with respect to claims 11-13 and 21, but reversing the rejection with respect to claims 17-19. In March of 2005, we received a memo, originally dated October 3, 2004, requesting "reconsideration [(rehearing)] of the decision . . . reversing the rejections of [claims 17-19] in Application Serial No. 08/249,689" from the Directors of Technology Center 1600 (TC's Request, page 1), together with appellant's response to the request for rehearing, dated November 24, 2004.<sup>3</sup>

Because issues remained that had not been sufficiently developed on the record, we remanded the application to the examiner on September 19, 2005 for clarification. Having considered the examiner's response to the remand, as well as appellant's subsequent comments, we have decided to grant the TC's request for rehearing.

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<sup>3</sup> Technology Center 1600's Request for Reconsideration (Rehearing) concerns our decision of October 30, 2003 in Appeal No. 2003-1335, reversing the final rejection of claims 17-19. While appellant amended certain claims and canceled others following our decision of October 30, 2003, the subsequently amended claims were not before us at the time of the decision. Therefore, we will address our comments to claims 17-19 as they appear herein, and in the Appendix to the Substitute Appeal Brief, submitted December 9, 2002.

### THE CLAIMS

Claim 17 is directed to a compound that binds a critical region within the minor groove of the acceptor stem of a transfer RNA molecule and inhibits its function; claim 18 specifies that the transfer RNA is tRNA<sup>Ala</sup>; and claim 19 identifies the critical region of the tRNA<sup>Ala</sup> as the G3:U70 base pair. Claims 17-19 (and claims 11 and 12, from which they depend) read as follows:

11. A complementary compound comprising hydrogen bond donor and acceptor sites arranged to specifically bind and inhibit the function of a targeted RNA molecule, wherein the compound is specifically directed to and binds to a critical region of the RNA molecule, located within the minor groove of the RNA molecule, identified by a combination of the primary, secondary and tertiary structure of the critical region.

12. The complementary compound of claim 11 wherein the RNA is selected from the group consisting of mRNA, tRNA, rRNA, and viral RNA.

17. The complementary compound of claim 12 wherein the compound binds to a critical region within the minor groove of the acceptor stem of a tRNA molecule.

18. The complementary compound of claim 17 wherein the tRNA molecule is tRNA<sup>Ala</sup>.

19. The complementary compound of claim 17 wherein the critical region is the G3:U70 base pair.

### DISCUSSION

In a nutshell, the issue to be considered here is whether we were correct in “conclud[ing] that the specification provides an adequate written description for the [inhibitory compounds] of claims 17-19 because the structure of at least one of the two mutually dependent compounds, in this case, the RNA target molecule, is ‘sufficiently known or disclosed’” (Opinion of October 30, 2003, page 7).

“The ‘written description’ requirement serves a teaching function, . . . in which the public is given ‘meaningful disclosure in exchange for being excluded from practicing

the invention for a limited period of time.” University of Rochester v. G.D. Searle & Co., Inc., 358 F.3d 916, 922, 69 USPQ2d 1886, 1891 (Fed. Cir. 2004) (citation omitted).

Another “purpose of the ‘written description’ requirement is . . . [to] convey with reasonable clarity to those skilled in the art that, as of the filing date [ ], [the applicant] was in possession of the invention.” Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). The requirement is satisfied when the specification “set[s] forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed.” Rochester, 358 F.3d at 928, 69 USPQ2d at 1896. Whether or not a specification satisfies the requirement is a question of fact, which must be resolved on a case-by-case basis (Vas-Cath, 935 F.2d at 1562-63, 19 USPQ2d at 1116).

In Enzo Biochem Inc. v. Gen-Probe Inc., 296 F.3d 1316, 63 USPQ2d 1609 (Fed. Cir. 2002), the Court of Appeals for the Federal Circuit clarified that “[not] all functional descriptions of genetic material fail to meet the written description requirement,” and that “the written description requirement would be met for [a claim] . . . if the functional characteristic . . . were coupled with a disclosed correlation between that function and a structure that is sufficiently known or disclosed.” Id. at 1324-25, 63 USPQ2d at 1613. As an example of such a correlation, the court cited the Patent and Trademark Office’s (PTO) internal guidelines for determining compliance with the written description requirement (Guidelines for Examination of Patent Applications Under the 35 U.S.C. § 112, ¶ 1, “Written Description Requirement,” 66 Fed. Reg. 1099 (January 5, 2001)) (Guidelines), as indicating that “the PTO would find compliance with § 112, ¶ 1, for a claim to an ‘isolated antibody capable of binding to antigen X,’ notwithstanding the

functional definition of the antibody, in light of ‘the well defined structural characteristics for the five classes of antibody, the functional characteristics of antibody binding, and the fact that antibody technology is well developed and mature.’” Enzo, 296 F.3d at 1324-25, 63 USPQ2d at 1613.<sup>4</sup>

In Noelle v. Lederman, 355 F.3d 1343, 1349, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004), the court, “based on [ ] past precedent,” reiterated that “an applicant [who] has disclosed a ‘fully characterized antigen,’ either by its structure, formula, chemical name, or physical properties, . . . can then claim an antibody by its binding affinity to that described antigen.”

The significance of the court’s adoption of a portion of the PTO’s internal guidelines in Enzo is what it tells us about the factors that should be considered in determining whether or not a claim is supported by an adequate written description. These factors were summarized by the PTO at page 1106 of the Guidelines, and include “the level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or

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<sup>4</sup> The example referred to here (Example 16 of the USPTO’s Synopsis of Application of Written Description Guidelines (Application of Guidelines), still available at <http://www.uspto.gov/web/patents/guides.htm> as of June, 2006, stipulates that antigen X has been isolated and characterized and that the specification includes a complete protocol for its isolation. “Considering the routine art-recognized method of making antibodies to fully characterized antigens, the well defined structural characteristics for the five classes of antibody, the functional characteristics of antibody binding, and the fact that antibody technology is well developed and mature,” the Application of Guidelines indicates that the written description requirement is met because “one of skill in the art would have recognized that the spectrum of antibodies which bind to antigen X were implicitly disclosed as a result of the isolation of antigen X.”

disclosed correlation between structure and function, and the method of making the claimed invention.”

More recently, in Capon v. Eshhar, 418 F.3d 1349, 1357, 76 USPQ2d 1078, 1084 (Fed. Cir. 2005), the court emphasized that “[t]he descriptive text needed to meet [the written description] requirement[ ] varies with the nature and scope of the invention at issue, and with the scientific and technologic knowledge already in existence.” Among the factors to be considered are “the existing knowledge in the particular field” and “the maturity of the science or technology” (id. at 1359, 76 USPQ2d at 1085).

In requesting reconsideration of our decision to reverse the rejection of claims 17-19, the TC’s position is essentially that our decision was based on “an incorrect analogy between description of antibodies whose antigenic target is described and description of a compound whose binding target is described” (TC’s Request, pages 5-6). In the TC’s subsequent Response to Remand, the examiner explains that “[t]he analogy is inaccurate” (TC’s Response to Remand, page 7), at least in part, because “possession of an antigen allows for assured possession of its corresponding antibody through well recognized methods . . . [even] without [ ] knowledge of the structure of the antibody” (id., page 6), but “there [is no] method of obtaining the claimed compound that is so direct and recognized that possession of the critical site equates to possession of the claimed compound” (id., page 7). “[U]nlike methods of making antibodies,” the examiner argues, “the art of making the claimed compounds is not well known and mature” (Request, page 10).

Moreover, the examiner notes that “[t]he CAFC has not extended [the] logic [of Enzo and Noelle] to other fact situations” (Response to Remand, page 11) “more relevant to the instant fact situation than the antigen-antibody situation” (id., page 10).

The examiner cites Univ. of Rochester v. G.D. Searle & Co., 358 F.3d 916, 69 USPQ2d 1886 (Fed. Cir. 2004) as an example wherein “claims . . . directed to a method of inhibition of cyclooxygenase COX-2 were not supported by an adequate written description because the specification did not describe the structure of COX-2 inhibitors . . . used in the method” (TC’s Request, page 7), even though “the COX-2 target and methods of assaying for inhibitors” were disclosed (id.).

With respect to Rochester, we would also note that the court commented unfavorably on the conspicuous absence of “evidence that any such [COX-2 inhibitors] were otherwise within the knowledge of a person of ordinary skill in the art at the relevant time” (Rochester, 358 F.3d at 929, 69 USPQ2d at 1897 (footnote omitted)).

In the present case, there is no dispute that the structures of at least four transfer RNAs, including tRNA<sup>Ala</sup>, had been extensively characterized prior to appellant’s invention (“X-ray diffraction analyses have established that virtually all tRNA molecules exist as hydrogen-bonded cloverleaf secondary structures, with tertiary structure formed by additional folding, as depicted . . . by computer modeling in Figure 2B [of the specification]” and “[h]igh-resolution, three-dimensional X-ray structures are available for four tRNAs, showing precise geometries of helical domains and confirming that the stem-loop is precisely folded into an L-shaped three-dimensional conformation with two helices and major and minor grooves” (specification, page 8)). Moreover, critical sites had been identified on several tRNAs (“For example, studies have demonstrated that the G3:U70 base pair of tRNA<sup>Ala</sup> is critical for its function” (id., page 5)).

In addition, the specification teaches that “[t]he chemical basis for the discrimination between different base pairs [in both DNA and RNA] lies in the order of hydrogen bond acceptor and donor groups across the base pair that is accessible to a

protein" (Specification, page 18). In DNA, however, the "array of hydrogen bonds permits all four base pairs to be distinguished from each other on the basis of major groove interactions" (id.), while "[t]he primary basis for sequence discrimination in RNA is believed to be the minor groove" (id., page 20).

The specification teaches that the claimed inhibitors can be designed and synthesized "using methodology derived from studies using DNA and DNA-protein interactions, in combination with an understanding of the differences in the chemical and physical composition of RNA as compared to DNA, and knowledge as to the specific region to be inactivated" (Specification, page 18). That is, "computer modeling is used in combination with analysis of [a] targeted RNA sequence to design molecules binding to the targeted RNA by covalent or hydrogen [bonding]" (id., page 5).

Finally, the specification teaches that "[a]n example of the [computer] modelling system . . . generally consists of the CHARMM and QUANTA programs . . . CHARMM performs [ ] energy minimization and molecular dynamics functions. QUANTA performs [ ] construction, graphic modelling and analysis of molecular structure[,] [and] allows interactive construction, modification, visualization, and analysis of the behavior of molecules with each other" (id., page 37). In addition, "[o]ther computer programs that screen and graphically depict chemicals . . . can be adapted to design [ ] drugs specific to regions of RNA, once that region is identified" (id., page 38). Nevertheless, the specification indicates that "computer modeling has not been used to design compounds that will bind to and inactivate RNA" (id.).

Appellant's position is (and has been) essentially that it was well known that "the forces that drive the complementary interactions between antibody/antigen and

compound/RNA are the same” and “define their respective structures” (Brief, page 21);<sup>5</sup> that the identification of a specific critical site in the minor groove of an RNA molecule “is parallel to the ‘isolation of antigen X’” (id.); and that “[o]nce one of skill in the art knows that one must target the minor groove of the RNA . . . , then one has no difficulty in obtaining compounds” (id., page 23). According to appellant, the Williamson and Rebek declarations<sup>6</sup> “clearly elaborate[ ] upon the present specification’s discussion of the forces presented in and by the targeted RNA” (id., page 24). Moreover, appellant argues that the specification, and Dr. Williamson’s declaration in particular, establish that “there was precedence for targeting to a groove of a nucleic acid helix, although it was not the minor groove, and many software programs were available that make it completely routine to insert the known nucleotide sequence of the target RNA into the program, and have it display structures that define the shape and composition of the claimed inhibitor” (id., page 23). Appellant argues that the specification discloses “functional characteristics [of the claimed compounds] coupled with a correlation between structure and function” (id., page 14), and that “software programs were available that make it completely routine to insert the known nucleotide sequence of the target RNA into the program, and have it display structures that define the shape and composition of the claimed inhibitor[s]” (id., page 23).

Nevertheless, it is undisputed that the specification does not disclose any examples of the design, synthesis or testing of compounds that bind to the minor

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<sup>5</sup> The Brief referred to herein is appellant’s Substitute Appeal Brief submitted December 9, 2002.

<sup>6</sup> Declarations of Dr. Julius Rebek, an expert in the field of molecular recognition, and Dr. James R. Williamson, an expert in the field of RNA and drug design in general (both declarations submitted April 11, 2002, under the provisions of 37 CFR § 1.132).

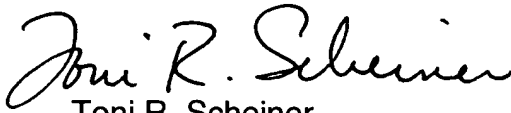
groove of a targeted RNA. Moreover, despite appellant's assertion in the Brief that "software programs were available that make it completely routine to . . . display structures [ ] defin[ing] the shape and composition of the claimed inhibitor[s]" (Brief, page 23), there is no evidence of record that using those programs to design and/or visualize RNA inhibitors was "well developed and mature." Indeed, according to the specification, "computer [modeling] [had] not been used to design compounds that will bind to and inactivate RNA" at the time of the invention (Specification, page 38). In contrast to the recognized state of antibody technology, there is no evidence of record that any technology that might have been involved in visualizing and/or designing the claimed RNA inhibitors was similarly "well-developed and mature" at the time of the invention, such that one of ordinary skill in the art would have understood or been able to recognize the claimed inhibitors from a description of the target RNA.

Again, one "purpose of the 'written description' requirement is . . . [to] convey with reasonable clarity to those skilled in the art that, as of the filing date [ ], [the applicant] was in possession of the invention" (Vas-Cath, 935 F.2d at 1563-64, 19 USPQ2d at 1117), and the requirement is satisfied when the specification "set[s] forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed" (Rochester, 358 F.3d at 928, 69 USPQ2d at 1896). Upon reflection, we conclude that appellant's disclosure does not accomplish either of these objectives, and that claims 17-19 are not supported by adequate descriptive support in the specification. Accordingly, our decision of October 30, 2003 is modified to the extent that the rejection of claims 17-19 under 35 U.S.C. § 112, first paragraph, is affirmed.

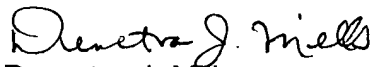
CONCLUSION

Technology Center 1600's request for rehearing is granted. The rejection of claims 17-19 under 35 U.S.C. § 112, first paragraph, is affirmed.

REHEARING GRANTED



Toni R. Scheiner  
Administrative Patent Judge



Demetra J. Mills  
Administrative Patent Judge



Eric Grimes  
Administrative Patent Judge

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Patrea L. Pabst  
Pabst Patent Group LLP  
400 Colony Square  
Suite 1200  
Atlanta, GA 30361